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Germs to aid Great Salt Lake?

Using microbes to fight mercury among scientists' innovative ideas

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Tiny microbes might be the best hope for cleaning up the toxic mercury pollution in the Great Salt Lake.

As part of their biological routine, microbes with certain genes make mercury less poisonous, according to the Center for Integrated Biosystems at Utah State University.

It was one of the ideas that surfaced this week at an international gathering of salty-lake researchers from around the world. The scientists shared their latest findings at the University of Utah during a joint meeting of the Friends of the Great Salt Lake and the 10th International Conference on Salt Lake Research.

The scientists sprinkled their presentations on saline ecosystems with field trips to the nearby Great Salt Lake, the second-saltiest and fourth-largest terminal lake in the world. Friday morning lectures brought the Great Salt Lake mercury problem into sharper focus.

Bruce Waddell, a retired biologist for the U.S. Fish and Wildlife Service, told about the lake's widespread contamination by urban Utah's byproducts. His tests of water, bird eggs, fish tissues, sediment and invertebrates turned up a broad range of pollutants.

Heavy metals from mining, mercury from polluted air, pesticides from runoff, organic chemicals from plastics, oil refining, drugs and petrochemicals - all turned up in samples Waddell collected over four years.

Mercury is a health and environmental problem because, when transformed in the lake's low-oxygen water, it becomes toxic methylmercury and builds up in the food chain. Consumption limits have been placed on four Great Salt Lake game birds because of methylmercury contamination.

Nathan Darnall, currently with the Fish and Wildlife Service, looked at trends in migratory eared grebes. He found that:

- * Toxic methylmercury increases in the grebes during three to four months they nest and molt on the Great Salt Lake.

- * Great Salt Lake grebes ingest more mercury than their cousins at Mono Lake, Calif.

- * Mercury contamination has increased threefold in the past 10 to 15 years.

Jacob Parnell, a USU researcher, discussed findings about the interrelation between sulfates, mercury and some microbes. The dynamic between them speeds up methylation - the process that transforms mercury metal into its highly toxic form. It also fuels the chemical process that restores mercury to its less poisonous form - about 10 to 1,000 times less poisonous.

The Center for Integrated Biosystems has identified two genes that are common to the many tiny organisms involved in the process.

Some day, said Parnell, it might be possible to boost the processing power of these microbes to help reduce the amount of methylmercury.

"If we are going to remediate the lake, it has to be done biologically," he told fellow researchers.

The scientists often lamented the limited funding that is available for understanding unique ecosystems associated with supersalty lakes.

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About the lake

- * **The Great Salt Lake is the fourth-largest** saline lake in the world and the second saltiest.

- * **It is the largest lake** west of the Mississippi.

- * **Millions of migratory birds** rely on the lake each year as a rest stop, breeding ground and staging area.